

REMARKS

Claims 1-19 are pending in this application.

Claims 1, 3-10, 12-17, and 19 have been rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,275,604 to Miyajima. Claims 2, 11 and 18 are rejected as obvious over Miyajima in view of Sakakibara. Applicants respectfully traverse these rejections.

Regarding claims 1, 5, and 7, the Examiner states that Miyajima is capable of varying the shape of a pattern using the set-up shown in Fig. 1 comprised of two apertures and a deflection device. He argues that the beam that passes through the aperture 11 changes its size depending on the overlap of the aperture 11 with the aperture 14.

In response to this rejection, Applicants note that patterns, the sizes of which can be varied by varying the first aperture 11 with respect to the second aperture 14, are limited to rectangles only. Various types of other patterns 15-17 shown in Fig. 2 are not disclosed as being the results of variability in patterns. Rather they are data in a library of figure patterns from which an appropriate pattern to be drawn may be selected. Therefore, the disclosed and intended manner of operation is this :to choose an appropriate figure pattern, the opening of which corresponds to the desired pattern to be drawn, from among figure patterns prepared beforehand through a choosing process performed by a CPU; to apply the electron beam passed through the first aperture over the entirety of the opening of chosen figure pattern using said chosen pattern as a fixed figure; and then to draw the chosen figure pattern as the fixed figure without any changing or variation in sizes or a style.

In contrast to this, what the present invention claims is a method of and an apparatus for drawing an oblique figure freely varying into a desired size by means of applying the electron beam passed through the first aperture to an intended part of the oblique pattern opening provided on the second aperture using the deflecting system.

As to claim 3, the Examiner contends that Miyajima discloses, employing Fig. 13 and the detailed description of the processing aspects in CPU 32, a method of drawing the pattern 72 by means of BP 11 (an oblique pattern). Applicants disagree with the Examiner's conclusion. The description referring to Figs. 13A-D defines a drawing method, in which a figure 71 is converted into an approximate figure 72 through CPU processing and then the approximate figure 72 is drawn by a repeated use of the pattern equivalent to the second aperture opening BP 11 (a fixed oblique figure) shown in Fig. 10. This means that the description in the reference does not describe a varying method for freely changing the size of an oblique figure into a desired size.

In rejecting claim 14, the Examiner says that the use of a shape modification process defined by Miyajimaa is equivalent to the use of the variable parallelogramatic aperture defined in the present invention. What is illustrated by the flow chart in Fig. 6 is an input figure conversion process using a processor such as a CPU. When the figure input is not a rectangle, the input figure is classified into a category such as a triangle or a parallelogram. Then the classified input figure is approximated by one of a plurality of apertures in a library of fixed apertures (Fig. 2 and Fig. 10) prepared beforehand. Based on an approximation, the process draws the figure using the fixed figure (the size of which is not variable) using the corresponding aperture such as BP (2) in the case of Fig. 11, BP (11) in Fig. 13, BP (2) in Fig. 16, and BP (12) in Fig. 22.

In the presently claimed invention, on the other hand, the process is one of drawing a figure by varying the size of a parallelogram. This is substantially different from what is described in the above-cited reference.

The shape modification process defined in Miyajima is a process that approximates an input figure to one figure in a group consisting of a plurality of fixed figures prepared beforehand. Miyajima does not teach or suggest a process such as that claimed in which a parallelogram, for example, is varied in size and then drawn. In contrast to Miyajima, the process defined in the present invention is a process that generates a variable sized parallelogram by applying a treatment similar to the rectangle-varying processing when a drawing having a pattern such as a parallelogram is desired.

If it is the Examiner's contention that, in Miyajima, the size of a figure can be varied by operating the deflector 20 , and that consequently the present invention is suggested by this disclosure, Applicants submit that the Examiner is extending this teaching far beyond what would be suggested to the person of ordinary skill in the art.

With respect to claim 2, Applicants note that the reason for specifying a numerical limitation for an oblique pattern is that an oblique pattern having a line width less than 1 μm is regarded as a non-minute pattern and drawing such oblique pattern with a conventional technique of using small-sized variable rectangles is thought to incur no problems. This conventional technique is a drawing method wherein an oblique pattern is formed by chaining triangles or fine rectangles.

The present invention relates particularly to a method of drawing a minute oblique pattern. When a minute oblique pattern is drawn by chaining variable rectangles or triangles (referring to Fig. 3 in Miyajima's patent specification), a junction point on such a chain produces an imperfect pattern. Thus, the present invention has the advantage of offering a high precision drawing thanks to chaining variable oblique patterns.

CONCLUSION


The fundamental difference between Miyajima's teaching and the presently claimed invention is that the drawing method of Miyajima is to use fixed figures and parallelogramatic apertures, but the drawing method presently claimed is to use size-variable parallelogramatic apertures. The generation of such size-variable parallelogramatic apertures is in now ay taught or suggest by Miyajima. Nor does Sakakibara make up for the missing teaching. Thus, all claims in this application are in condition for allowance, prompt notice of which is respectfully solicited.

The Examiner is invited to call the undersigned at (202) 220-4200 to discuss any information concerning this application.

The Office is hereby authorized to charge any additional fees under 37 C.F.R. § 1.16 or § 1.17 or credit any overpayment to Deposit Account No. 11-0600.

Respectfully submitted,

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